DOCUMENT RESUME

ED 464 626 IR 021 396

AUTHOR	Veteto, Bette R.
TITLE	Elementary Algebra + Student-Written Web Illustrations = Math Mastery.
PUB DATE	2002-04-00
NOTE	9p.; In: Teaching, Learning, & Technology: The Connected Classroom. Proceedings of the Annual Mid-South Instructional Technology Conference (7th, Murfreesboro, TN, April 7-9, 2002); see IR 021 870.
AVAILABLE FROM	For full text: http://www.mtsu.edu/~itconf/proceed02/index.html.
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Active Learning; *Algebra; *Computer Uses in Education; Higher Education; *Mathematics Instruction; Student Developed Materials; *World Wide Web
IDENTIFIERS	*Technology Utilization; University of Memphis TN; *Web Page Design; Web Pages

ABSTRACT

This project focuses on the construction and use of a student-made elementary algebra tutorial World Wide Web page at the University of Memphis (Tennessee), how this helps students further explore the topics studied in elementary algebra, and how students can publish their work on the class Web page for use by other students. Practical, understandable student Web illustrations and the technology skills necessary to carry out the project are presented and explained. Ways in which the project enhanced the teaching/learning experience are listed. (Author/MES)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 464 626

Elementary Algebra + Student-Written Web Illustrations = Math Mastery

Bette R. Veteto
Math Instructor

The University of Memphis
Administration Building #203
Memphis, Tennessee 38152

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

L. Lea

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

IR021396

BEST COPY AVAILABLE

Abstract

This project focuses on how to construct and use a student-made elementary algebra tutorial web page, how this helps students further explore the topics studied in elementary algebra, and how students can publish their work on the class web page for use by other students. Practical, understandable student web illustrations and the technology skills necessary to carry out the project are presented and explained.

Elementary Algebra + Student-Written Web Illustrations = Math Mastery

Introduction

The value of using web technology to supplement instruction or to deliver instruction is becoming apparent. Teachers and students can produce learning materials and publish them on the web for their own use and for the use of other students. The asynchronous aspect of this method of delivering tutorial services is a very valuable option to offer students. The author's university is encouraging teachers and students to become involved in delivering or supplementing their teaching and learning with technology. Grants are awarded each spring to deserving projects. This project was funded by a small technology grant awarded by the university. After considering ways to use technology to improve teaching and learning, the author decided to plan a project in which one section of her elementary algebra students would construct a tutorial web page covering selected topics in the course.

Rationale for Constructing an Elementary Algebra Tutorial Web Page

The second National Council of Teachers of Mathematics standard says that students need to "be able to reflect upon and to clarify their thinking about mathematical ideas and relationships, and to express mathematical ideas in writing" (Curriculum and Evaluation Standards for School Mathematics, 1989, p. 140). By incorporating reading, writing, and active learning projects into regular algebra course work, students can process the math topics studied in more depth and can connect topics to specific applications. This holistic approach to studying mathematics, computation, application, illustration, reading, and writing, will offer several approaches to mastering the content of the course which will honor the diversity of student learning styles. Most of the students

in this course are freshmen, and adding an active learning, technology component might impact positively how they view math and give them a more positive attitude toward subsequent math courses and toward the benefits of using technology.

Also, the *1990 Harvard Assessment Survey on the Effectiveness of Teaching* suggested several effective college teaching methods. One of the methods was active learning in small groups inside or outside of class which produced higher grade averages, more student involvement, more depth of understanding, and more enjoyment in the learning process. This web project gets them involved in small-group active learning projects which they publish to the class web page. This group work combined with the technology component will produce students who better understand math and who can navigate the World Wide Web and who can publish their work on the Web. Groups can communicate in class, out of class, and by email. The project promotes close teacher-student interaction as each group comes to the teacher's office for help in publishing their work to the class web page.

Project Description

In the summer before the project began, the teacher constructed a web page in Netscape Composer which contained an outline of each topic studied in the 0820 elementary algebra course arranged by chapter. The web address of this page is http://www.memphis.edu/~brveteto/grant.htm. This became the skeleton of the class web page to which the students would link their work. During this same summer period, the teacher planned 5 projects for 5 groups for a total of 25 topics for which the student groups would construct short explanatory web pages as links. The teacher also made sure that she had the requisite software on her office computer—Composer, PowerPoint,

MSWord. An Internet connection is also an assumed component. A scanner was purchased with grant money, and a departmental digital camera was available for use. Practice using all these components was carried out in this summer term, since the project required that the teacher show groups of students how to use them.

Student Group Work

Elementary Algebra section 003 was chosen for this project, since it had a manageable enrollment, 27 students. It was mentioned on the first day of class as the syllabus was discussed that there was an Internet component to the class. This was done to allow students time to switch sections if they chose. Each student was given an assignment to go to the computer lab and get a username and password. A lab attendant would help them if they didn't know how to do it.

During the second week of school, the project was explained in detail during class time. A color print out of the class web page was shown, the group project assignment sheet was distributed to each person, and group assignments were made by the teacher. During the next class period, a 20-minute group time was allotted, and each group planned its first project (all from Chapter 1 which we were studying). The teacher gave suggestions and help as needed. Also, the teacher helped the group which had the active learning project which required that a picture of the group be taken—figure slope of handicap ramp, estimate height of tree using similar right triangles, take Celsius and Fahrenheit temperatures and plug into conversion formulas. Each group made an appointment with the teacher for the next week to place their work onto the web page. This procedure was repeated five times for each of the five chapters in the course.

As each group kept its appointment with the teacher, they were shown how to put their information into the appropriate format—PowerPoint, Composer, Word to html, etc. The group with the picture scanned it onto a disk using the teacher's scanner; then they made their web page in Composer and inserted the picture. The groups were then shown how to move their web page onto the server and how to link it to the class web page. Before they left the teacher's office each time, they could view their work linked to the class web page. For the Chapter 4 and 5 project, a digital camera was used which placed the picture onto a disk automatically, so that the scanner was not needed.

Results

The completed class web page project can be viewed at http://www.people.memphis.edu/~brveteto/grant.htm.

The teaching/learning experience for this class was enhanced by the project in several ways.

- The added dimension of researching math topics on the web gave them a sense of the wider application of the math concepts they were learning in class.
- Math understanding was promoted by actually using the formulas in active projects. They collected their own data to use and did not just use values that the book gave.
- Explaining in steps how to work a problem in order to create a PowerPoint slide required that they understand the material well, so they could explain the procedure to others.
- The group members had to learn to cooperate to get the projects completed on time. This is a skill which will have value in university life and work life.

- The student-teacher interaction was increased inside and outside of class over regular classroom situations.

- Technology skills were learned and practiced. A questionnaire given by the teacher at the end of the project showed that the students found the project valuable. They valued the skills and information learned. They recognized the importance of the Internet in their personal, school, and career lives; and they recognized that there was a lot of valuable mathematics information available on the Internet.

- The students in the class used the completed web page to help them prepare for their final exam. The teacher asked each student to view at least three topics off the page in preparation for the final exam.

The value of the project to these students who constructed the web page was in the active learning they did in groups to prepare the topics for publishing and in being exposed to the methods of preparing and publishing their work on the web. As the students used the technology components, the teacher suggested that they go to the U of M Training Center and sign up for a free course on how to use them—PowerPoint, Netscape Composer, etc. This project exposed them to the basics of what is possible in using the web as a learning/teaching tool, but they need to pursue the technology skills further on their own in order to use them proficiently while they are at the university and to use in their jobs after graduation.

Further Plans

The tutorial web page constructed by these students only involves 25 links. The other topics on the page need to be finished. The teacher could finish the web page, or she could run the same project again with another class. The completed web page will be a resource for students who need to review topics and for students who have missed class and need help. It can be used for my elementary algebra students in subsequent semesters and for any elementary algebra student on campus. Quite likely, it will come

up in web searches and could also be valuable for students and teachers nationwide as an example of student web publications and for the math information it contains.